

MOHAMAD SADEGH SOTOUDEGAN

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FIELDS OF SPECIALIZATION/INTEREST

- MEMS Devices
- Microcantilever-Based Sensors
- Microfluidics
- Fluid-Structure Interaction
- Structural Mechanics
- Finite Element Analysis (FEA)
- Computer-Aided Design (CAD)

EDUCATION

- 2013-2016 **Marquette University** Milwaukee, WI, USA
- Ph.D., Structural Engineering/Mechanics (GPA: 3.806)
Dissertation: “Analytical Modeling of a Novel Microdisk Resonator for Liquid-Phase Sensing: an All-Shear Interaction Device (ASID)”
- 2012-2013 **Marquette University** Milwaukee, WI, USA
- M.S., Structural Engineering/Mechanics
- 2006-2011 **Iran University of Science and Technology** Tehran, Tehran, Iran
- B.S., Mechanical Engineering

PROFESSIONAL EXPERIENCE

- 2020-present **University of North Carolina at Chapel Hill** Chapel Hill, NC, USA
- Research Associate: “Design and Fabrication of Microfluidic Devices to Study Single-Cell Virology/Infection Dynamics. Contribution to the Study of the Coronavirus (SARS-CoV-2) Genome Replication”
- 2018-2019 **North Carolina State University** Raleigh, NC, USA
- Postdoctoral Research Scholar: “Developing Paper-Fluidic Passive Pumps to Power Point-of-Care Microfluidic Devices”
- 2017 (Jul. – Nov.) **Openso Engineering** Edwardsville, IL, USA
- Senior Design Engineer: “Structural Design and Analysis, Pressure Vessel Design, Finite Element Analysis, Computational Fluid Dynamics”
- 2012-2016 **Marquette University** Milwaukee, WI, USA

- Graduate Research Assistant: “Vibration Analysis of Liquid-Phase Microscale Resonators”

2010-2011 **Iran University of Science and Technology** Tehran, Tehran, Iran

- Undergraduate Research Assistant: “In-Fluid Vibration of AFM Microcantilevers in the Vicinity of a Surface”

HONORS AND AWARDS

- Outstanding Research Assistant, CCEE Department, Marquette University, 2013-14
- Richard W. Jobling Fellowship, Marquette University, 2013
- Graduate Student Research Travel Award, Marquette University, 2013
- Leslie G. and Cecile C. Matthews Scholarship, Marquette University, 2015
- Joseph A. and Dorothy C. Rutkauskas Scholarship, Marquette University, 2015
- Arthur J. Schmitt Fellowship, Marquette University, 2015-16
- Joseph A. and Dorothy C. Rutkauskas Scholarship, Marquette University, 2016

BOOK CHAPTERS

- Sotoudegan, M.S., Arnold, J.J., Cameron, C.E., “Single-Cell Analysis for the Study of Viral Inhibitors,” Ch. 5 of *The Enzymes: Viral Replication Enzymes and their Inhibitors (Vol. 49)*, Cameron, C.E. and Arnold, J.J. (eds.), Elsevier, 2021.

REFEREED JOURNAL PUBLICATIONS

In Print or Accepted

- Mohd, O., Sotoudegan, M.S., Ligler, F.S., Walker, G.M., “A Simple Cantilever System for Measurement of Flow Rates in Paper Microfluidic Devices,” **Engineering Research Express**, Vol. 1, No. 2, 2019.
- Sotoudegan, M.S., Mohd, O., Ligler, F.S., Walker, G.M., “Paper-Based Passive Pumps to Generate Controllable Whole Blood Flow through Microfluidic Devices,” **Lab on a Chip**, Vol. 19, No. 22, 2019, pp. 3787-3795.
- Sotoudegan, M.S., Heinrich, S.M., Josse, F., Nigro, N.J., Dufour, I., and Brand, O., "Analytical Modeling of a Novel High-Q Disk Resonator for Liquid-Phase Applications," **Journal of Microelectromechanical Systems**, Vol. 24, No. 1, 2015, pp. 38-49. (Highlighted as one of three “JMEMS RightNow” papers in this issue by the JMEMS Editor-in-Chief due to its “excellent quality.”)
- Korayem, M.H., Sotoudegan, M.S., and Ebrahimi, N., “Effects of Geometrical Dimensions and Liquid Properties on Frequency Response of Resonating Microcantilevers in the Vicinity of a Surface,” **Precision Engineering**, Vol. 37, No. 4, 2013, pp. 831-838.

- Korayem, M.H., Ebrahimi, N., and Sotoudegan, M.S., “Frequency Response of Atomic Force Microscopy Microcantilevers Oscillating in a Viscous Liquid: A Comparison of Various Methods,” **Scientia Iranica**, Vol. 18, No. 5, 2011, pp. 1116-1125.

REFEREED CONFERENCE PUBLICATIONS

- Sotoudegan, M.S., Heinrich, S.M., Josse, F., Dufour, I., and Brand, O., “A Multi-Modal Continuous-Systems Model of a Novel High-Q Disk Resonator in a Viscous Liquid,” **Proc., 11th Nanomechanical Sensors Workshop (NMC)**, Madrid, Spain, 2014, pp. 98–99.
- Sotoudegan, M.S., Heinrich, S.M., Josse, F., Nigro, N.J., Dufour, I., and Brand, O., “Effect of Design Parameters on the Rotational Response of a Novel Disk Resonator for Liquid-Phase Sensing: Analytical Results,” **Proc., IEEE Sensors Conference**, Baltimore, MD, USA, 2013, pp. 1164–1167.
- Sotoudegan, M.S., Heinrich, S.M., Josse, F., Nigro, N.J., Dufour, I., and Brand, O., “A Simple Model for the In-Plane Rotational Response of a Disk Resonator in Liquid: Resonant Frequency, Quality factor, and Optimal Geometry,” **Proc., Nanomechanical Sensors Workshop (NMC)**, Stanford, CA, USA, 2013, pp. 107– 108.

TECHNICAL SKILLS

- MATLAB (Programming, Computation, Data Analysis, Image/Video Processing)
- COMSOL (Multiphysics Modeling and Simulation)
- ANSYS (Mechanical/Structural Analysis)
- AutoCAD (2D and 3D CAD Design)
- SolidWorks (3D CAD Design)
- Microsoft Office (Word, Excel, PowerPoint, Outlook)
- Soft Lithography
- Gene Cloning/Recombinant DNA
- Recombinant Protein Expression and Purification
- Cell Culture